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& observaturum integre omnes poenitentias, quae mihi impositae sunt, aut imponentur ab hoc S. Officio. Quod si contingat me aliquibus ex dictis meis promissionibus, protestationibus, & juramentis (quod Deus avertat) contraire, subjicio me omnibus poenis, ac suppliciis, quae a Sacris Canonibus, & aliis Constitutionibus generalibus, & particularibus contra hujusmodi delinquentes statuta, & promulgata fuerunt: Sic me Deus adjuvet, & Sancta ipsius Evangelia, quae tango propriis manibus.

Ego, GALILEUS GALILEI, supradictus abjuravi, juravi, promisi, & me obligavi ut supra, & in horum fidem mea propria manu subscripsi praesenti chirographo meae abjuratonis, & recitavi de verbo ad verbum.

Romae in Conventu Minervae, hac die 22. Junii Anni 1633.

Ego, GALILEUS GALILEI, abjuravi ut supra manu propria.

THE WASHBURN OBSERVATORY.

BY GEORGE C. COMSTOCK, DIRECTOR.

The University of Wisconsin owes to the late Governor C. C. WASHBURN the astronomical observatory which bears his name, but the original gift has been largely supplemented by both public and private munificence.

The observatory, as originally built in 1878, consisted of a dome, a centre hall, and two rooms, one east, the other west of the dome. To these were added, at the instance of the first Director, the late Professor J. C. WATSON, an east wing, connected to the original building by a corridor. The accompanying wood-cut shows the building as seen from the east; the west room which contains the meridian-circle being entirely hidden. In the foreground to the right, is the Students' Observatory containing the six-inch CLARK equatorial, aperture 152_{mm}, with which much of the early double-star work of Professor S. W. BURNHAM was done, and an admirable broken transit of 76_{mm} aperture, by BAMBERG, which is the finest instrument of its type I have ever seen. In the extreme left of the cut is seen the roof of the Solar Observatory, constructed at his own expense by Professor WATSON, and destined for the reception of an underground telescope to be used in a search for intra-mercurial planets.

A thorough test of the capabilities of such a telescope having been made with disappointing results by Professor E. S. HOLDEN upon his accession to the directorship of the observatory, the building has long since been relegated to humbler uses.

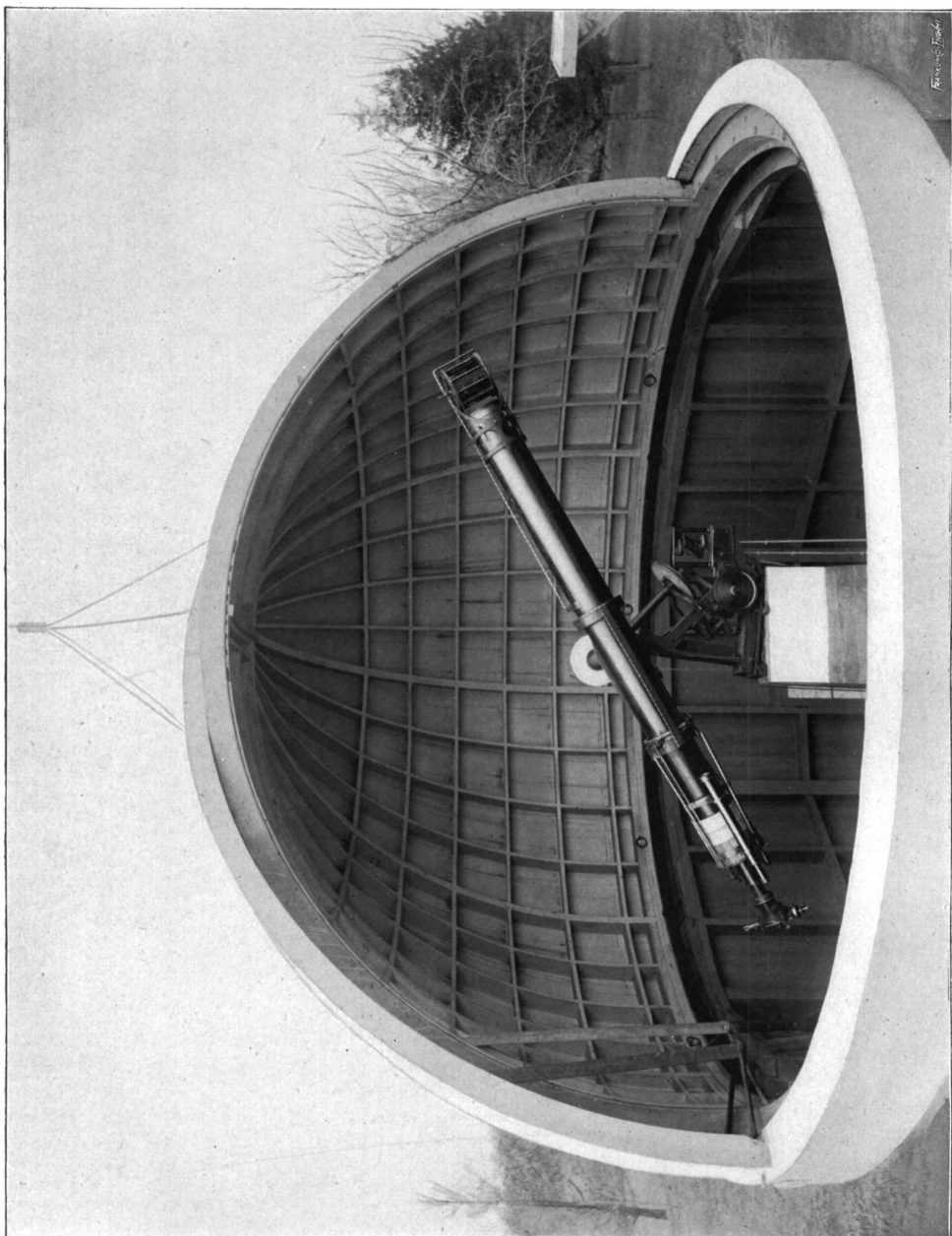
The topography represented in the cut is in some respects misleading, although it very well shows the open character of the surroundings. The observatory stands upon the crest of a hill, which slopes gently to the west, and more rapidly to the south and north, upon which latter side it descends to the shores of Lake Mendota, about a hundred feet below it.

The principal instruments of the observatory are the CLARK equatorial telescope of 395_{mm} (sixteen inches) aperture, and the REPSOLD meridian-circle of 122_{mm} (five inches) aperture. The latter instrument is substantially similar in construction and appearance to the one illustrated at page 86, Vol. III, *Publications* of the Astronomical Society of the Pacific, and in the hands of the successive observers who have used it, has proved capable of furnishing results of the highest order of excellence, both in the determination of star places and in the investigation of stellar parallaxes.

In its optical parts the CLARK equatorial has shown itself an instrument of very superior quality, but in respect of mounting it lacks many of the conveniences of more recently constructed instruments. It is provided with a filar micrometer, double-image micrometer spectroscope, a ZOELLNER astro-photometer and a very complete set of oculars.

The small equatorial in the Students' Observatory, shown in the accompanying cut, has been provided with a modified LOEWY prism apparatus and employed in various researches requiring the simultaneous observation of stars situated in widely different parts of the heavens. This has required the construction of the peculiar type of dome there shown, with revolving semi-circular shutter. This shutter has proved in practice an excellent device, and may be recommended for general use in small domes.

Three astronomical clocks (employed in connection with the railway time-service), chronometers, a chronograph, an excellent universal instrument, and a considerable amount of subsidiary apparatus employed in instruction, supplement the equipment above described. To this there should be added the excellent Woodman Astronomical Library, comprising over five thousand



books and pamphlets, which are housed in the east wing of the observatory.

The scientific activity of the observatory has lain almost wholly along the lines of the older astronomy of precision, and the chief results of that activity are set forth in the ten volumes of its *Publications*.

MADISON, December, 1896.

SOME LUMINOUS APPEARANCES IN THE SKY.

By W. H. S. MONCK.

In *Nature* for March 28, 1896, appeared an account of a luminous appearance seen in the sky by Dr. BRAUNER, of Prague, on the thirteenth of that month. There were five streaks reaching from the western horizon towards the zenith, apparently not of very long duration. It was only about an hour after sunset, and Dr. BRAUNER ascribed them to some peculiar reflection in the upper regions of the atmosphere. This explanation, however, is not applicable to a similar phenomenon described by Mr. LYON BROWNE, of Shrewsbury, in *Knowledge* for April; for it was seen at 8^h 30^m on the 4th of March, and therefore a considerable time after sunset. It disappeared in the course of ten minutes. It also stretched from the western horizon towards the zenith. Mr. BROWNE thought it might be the zodiacal light, but this seems hardly probable; and the descriptions given do not closely resemble the aurora.

The hypothesis of any peculiar reflection in the upper strata of the atmosphere is more clearly excluded by the following examples of similar phenomena seen in the east after sunset. Captain NOBLE describes one seen by him on the 28th of August, 1883, at 10^h 35^m P.M. "For a moment I thought I was tracing the apparition of a new and most glorious comet." It was seen in the east-northeast. His description appeared in *Knowledge*, and it seems that Mr. W. K. BRADGATE saw an appearance at Liverpool on the same night and in nearly the same direction that Captain NOBLE had seen it in Sussex, but the hour was so much later that it could hardly have been the same object. Then followed an account of a similar appearance seen by Mrs. HARBIN at